
A Survey of Smoking in Institutions That Educate Health Professionals

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THE ASSOCIATION between smoking and disease has been well documented (1,2). Recent attention in the literature has been focused on the effect of other people's cigarette smoke on the nonsmoker. The effects of such involuntary smoking depends on many factors, such as the health status of the person exposed, the exposure time, and the concentration and type of smoke in the room. Thus, effects may range from eye and throat irritations to respiratory infections, undesirable cardiac effects, asthma attacks, and impairments due to increased blood carbon monoxide levels (3-5). Health professionals can be expected to be particularly knowledgeable about the disease-producing effects of smoking and about the health benefits that are gained by stopping. Yet, health practitioners continue to smoke. The proportion of current cigarette smokers among professional groups has varied somewhat according to the year and geographic location of the study.

A 1975 national survey indicated that in the United States, 38.9 percent of the registered nurses, 21.0 percent of the physicians, and 23.3 percent of the dentists were smoking cigarettes (6,7). Among adults in the

United States, 39 percent of the men and 29 percent of the women were cigarette smokers in 1975 (6,7). Other studies of physicians have found that 17 to 26 percent were smokers (8-12). Female physicians have a higher percentage (35.8 percent) of current smokers than male physicians and women in general (13). Reports of additional studies of registered nurses give current smoking ranges from 26 to 36 percent in the United States (11,14,15) to 53.2 percent in Australia (16), smoking ranges which are higher than for the adult female populations in these countries.

In the course of their education in the health professions, students obtain theoretical and practical knowledge in the curriculum, as well as socialization into the values and behavior of their profession. Thus, the examples of leadership the students see in health promotion, preventive medicine, and other areas are likely to influence their own behavior and practice. Health professionals and school teachers have been called upon to serve as exemplars for the general public, students, and their coprofessionals (17,18). Although health professional educators are in a position to serve as role models, they have not exercised the overt leadership one might expect (19). Effective education about the health consequences of smoking should be included early in the curriculum and in an organized, systematic manner (20-22).

Professionals who advise patients to give up smoking, yet smoke themselves, are not fulfilling this exemplar role, and it is not likely that they will be taken

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seriously, since the average person feels that if physicians and nurses still smoke, it must be safe. If a teacher continues to smoke, and smoking is condoned within health education facilities, what message will the student really get? At best, perhaps, the message would be an ambivalent one, providing students who already smoke with justification for their behavior (22-24). Moreover, if an institution elects to exercise smoking restrictions, its message is more powerful than if it merely teaches students about the harmful effects of smoking or tells them that they should not smoke and yet they see some of their instructors and role models overtly smoking (25).

This study was designed to determine current smoking practices and policies in various institutions nationwide in which health professionals are being educated.

Method

A survey instrument was designed to elicit information about current smoking policies in institutions in which the following health professionals are prepared—physicians, nurses (associate degree (AD) and baccalaureate (BSN) degree programs), dentists, health educators, and public health practitioners. Elementary school teaching was included as a non-health profession for comparative purposes because teachers are exemplars for elementary school children. The instrument was pilot tested and revised. The 2-page final instrument contained 26 major items.

Sample. A random number table was used to obtain a sample from listings of schools and programs for each professional group. The questionnaires were sent to the administrative head of each program. Since the administrative head may be a practicing professional and also an educator, the individual respondent is referred to as the program head or program administrator throughout this paper. A total of 606 questionnaires were mailed; 366 were returned—an overall response rate of 60.4 percent. The highest response rate was from the public health discipline (N=12, 95.7 percent). The lowest response rate was from BSN nursing programs (N=70, 53.1 percent). It is interesting that AD nursing programs had a relatively high response rate (N=87, 66.9 percent). The numbers of schools, such as public health, dentistry, and medicine, are small in this sample because they are fewer in total numbers than the other school types represented.

The composition of the final sample of 366 respondents is shown in the following tabulation.

<i>Discipline</i>	<i>Sample</i>	
	<i>Number</i>	<i>Percent</i>
Nursing (AD)	87	23.8
Elementary education	80	21.9
Nursing (BSN)	69	18.8
Health education	60	16.4
Medicine	33	9.0
Dentistry	25	6.8
Public health	12	3.3
Total	366	100.0

Demographic description. Programs from all geographic areas of the United States were represented as follows:

Region	Number ¹	Percent
Midwest	113	31.1
South	92	25.4
Northeast	80	22.0
West	78	21.5
Total	363	100.0

¹Regions for 3 programs not reported.

Programs were located in 3 types of institutions: private non-church-related (N=42, 11.6 percent); private church-related (N=61, 16.9 percent); and public (N=258, 71.5 percent). The schools were located either on a medical center campus (N=71, 20.1 percent) or on a multipurpose campus (N=290, 79.9 percent). The size of the total student body of the institution ranged from less than 1,000 (N=39, 11.0 percent) to more than 25,000 (N=44, 12.5 percent).

The questionnaire elicited respondent's age, sex, and current smoking status. Of those responding to the question about sex, 148 were men and 172 were women. The majority of the respondents from the nursing programs were women, whereas the majority of the respondents from the medical and dental schools were men. Of the 320 respondents, 224 (71.5 percent) were between the ages of 41 and 60, but the relationship between the age of the program head and program type was not statistically significant. A nonsmoker was

defined as a person who had smoked fewer than 100 cigarettes in his or her lifetime and was not smoking cigarettes now. A former cigarette smoker was defined as a person who had smoked more than 100 cigarettes in his or her lifetime, but was not smoking cigarettes now. A current cigarette smoker was a person currently smoking cigarettes, and a pipe or cigar smoker was a person smoking only a pipe or cigars, or both, but not cigarettes.

The data were analyzed by computer. A chi-square statistic was used that made no assumptions about the normality of the population. The demographic variables are not presented in the results unless they are particularly relevant.

Smoking status. Differences in smoking status among the program administrators of different program types were statistically significant ($\chi^2=52.62$, $df=18$, $P<.001$). Among the professional groups, the lowest percentages of current cigarette smokers were in the public health programs—no one in these programs reported being a current cigarette smoker; in the health education programs, 17.2 percent reported being current cigarette smokers. The highest percentages of current cigarette smokers in the professional groups were among respondents from dentistry programs (36.0 percent), BSN programs (33.3 percent), AD nursing programs (28.4 percent) and among medical program heads (21.4 percent). Further data are shown in table 1. The data are comparable to those in other studies for the proportion of nurses and physicians who smoke. The

Table 1. Smoking status of program administrators, by program type¹

Smoking status	Program type															
	ADN		BSN		Elementary education		Health education		Dentistry		Medicine		Public health		Total ²	
	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent	Num-ber	Per-cent
Nonsmoker	47	58.0	31	47.0	34	43.6	29	50.0	10	40.0	9	32.1	3	25.0	163	46.8
Former cigarette smoker	12	14.8	13	19.7	22	28.2	15	25.9	4	16.0	8	28.6	5	41.7	79	22.7
Current cigarette smoker	23	28.4	22	33.3	14	17.9	10	17.2	9	36.0	6	21.4	0	0.0	84	24.2
Pipe or cigar smoker	0	0.0	0	0.0	8	10.3	3	5.2	2	8.0	5	17.9	4	34.3	22	6.3
Total	81	100.0	66	100.0	78	100.0	58	100.0	25	100.0	28	100.0	12	100.0	348	100.0

¹ $\chi^2 = 52.62$, $df = 18$, $P < .001$.

² Variations in totals are due to nonresponses.

NOTE: ADN—associate degree in nursing; BSN—baccalaureate degree in nursing.

proportion of current smokers among dentists is more comparable to the 1965 estimates for that group (11) and close to the estimate for men in the general population (11). The administrative role of these respondents may influence their smoking habits.

Although more women than men were current cigarette smokers, only men were pipe or cigar smokers. No statistically significant association between sex and smoking status was found. A higher percentage of non-smokers was found in the under-40 age group than in the other age categories, but there were no statistically significant differences between the ages of the program heads responding and their current smoking status (table 2).

Smoking policies. When asked if their institution had a written smoking policy, 245 (66.9 percent) of the respondents said "yes," 90 (24.6 percent) said "no," and 31 (8.5 percent) stated that they did not know. A statistically significant relationship was seen between total student body size and whether there was a written smoking policy ($\chi^2=21.56$, $df=10$, $P < .02$). The schools with larger student bodies were more likely to have written smoking policies, especially those with enrollments of more than 15,000. Respondents from

smaller schools were more likely to report that their school had no smoking policy, especially respondents from schools with enrollments under 5,000. In two studies in which hospital smoking policies were examined, the larger the hospital, the more likely it was to have a written smoking policy (26,27). There was no significant relationship between the smoking policy and type of institution, geographic location, type of institutional setting, or smoking status of the program administrator.

Respondents were asked to describe the smoking regulations for various campus areas. The distribution of these areas is shown in table 3. Smoking was prohibited most frequently in classrooms and libraries. All other facilities that were used primarily by groups as opposed to individuals, were more likely to allow smoking freely or to set aside a designated smoking area. This policy is not consistent with organized efforts to ban smoking in public places by such groups as the American Cancer Society, the American Lung Association, and the American Heart Association. The Department of Health, Education, and Welfare guidelines call for "no smoking" in classrooms and conference rooms and for the establishment of nonsmoking sections in cafeterias and libraries (28). The smoking status of the program administrators and their descrip-

Table 2. Smoking status of program head, by age

Smoking status	Under 40 years		41-60 years		Over 60 years		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Nonsmoker	37	53.6	94	43.7	7	43.7	138	46.0
Former cigarette smoker	14	20.3	49	22.8	6	37.5	69	23.0
Current cigarette smoker	15	21.7	56	26.1	2	12.5	73	24.3
Pipe or cigar smoker	3	4.4	16	7.4	1	6.3	20	6.7
Total	69	100.0	215	100.0	16	100.0	300	100.0

Table 3. Description of smoking regulations in several campus areas

Area	Smoking prohibited		Designated smoking area		Smoking allowed freely		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Classroom	310	86.1	3	0.8	47	13.1	360	100.0
Library	230	65.1	102	28.9	21	6.0	353	100.0
Meeting rooms	85	23.9	25	7.0	246	69.1	356	100.0
Halls	79	22.8	43	12.4	225	64.8	347	100.0
Cafeteria	49	20.9	94	40.0	92	39.1	235	100.0
Department offices	49	13.8	11	3.1	294	83.1	354	100.0
Residences	18	6.3	46	16.0	224	77.7	288	100.0

NOTE: Total numbers vary for each area because of nonresponses and nonapplicable responses.

tions of smoking policies in the departmental office areas showed a statistically significant relationship ($\chi^2=16.68$, $df=6$, $P < .02$); this relationship was not seen for other variables. Both current and former smokers were more likely to indicate that smoking was allowed freely in departmental offices—areas in which the program administrators might be able to exercise some direct control.

Program heads were asked: "Has there been any advocacy of an institution-wide 'no smoking' policy on your campus?" Such advocacy was described by 104 (28.6 percent) respondents. This advocacy was related to the geographic location of the institution; schools in the West were more likely to show advocacy for "no smoking" across campus than those in the Midwest, Northeast, or South ($\chi^2=16.26$, $df=6$, $P < .02$). Advocacy was also significantly related to the kind of institutional setting; more advocates for such a policy were reported for medical center campuses than for multipurpose campuses, but with almost equal percentages of respondents reporting no advocacy on their campus. Twice as many respondents on the multipurpose campuses as on the medical center campuses did not know if there was or was not any "no smoking" advocacy at their institution (table 4). Although more medical, dental, and public health programs are on medical center campuses and most AD nursing, health education, and elementary education programs are on

multi-purpose campuses, there was no significant relationship between program type and advocacy. The medical center environment may engender more awareness of smoking as an issue, or the implementation of a no-smoking policy may be perceived as more feasible on medical center campuses.

Actual attempts to institute an all-campus nonsmoking policy were reported for fewer schools than the number that advocated it. Of the 363 respondents, 73 (19.8 percent) said that attempts to institute a nonsmoking policy had occurred on their campuses. However, these attempts do not appear to have been successful—only eight institutions described smoking as being totally banned; seven of these were church-related institutions, and one was a State college.

Administrators were seen by the respondents as being the most active in advocating a no-smoking policy ($N=55$, 52.9 percent). The next most frequently cited groups were general faculty ($N=42$, 40.8 percent), students ($N=36$, 34.6 percent), and nursing faculty ($N=33$, 31.7 percent). The general public was seen as least active ($N=7$, 6.7 percent).

Resistance to any limitation of smoking on campus was perceived by 138 (38.1 percent) of the respondents. Those on multipurpose campuses were more likely to report resistance and also less likely to definitely know of smoking limitation (table 5). The perceived resistance to limiting smoking also was significantly re-

Table 4. Relationship between advocacy of institutionwide no-smoking policy and campus type

Campus type	Advocacy		No advocacy		Don't know		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Medical center	31	43.6	30	42.3	10	14.1	71	100.0
Multipurpose	72	24.9	131	45.3	86	29.8	289	100.0
Total	103		161		96		360	

NOTE: $\chi^2 = 12.37$, $df = 2$; $P < .01$.

Table 5. Relationship between perceived resistance to smoking limitation and campus type

Campus type	Resistance		No resistance		Don't know		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Medical center	22	31.9	37	53.6	10	14.5	69	19.4
Multipurpose	113	39.4	95	33.1	79	27.5	287	80.6
Total	135		132		89		356	

NOTE: $\chi^2 = 10.95$, $df = 2$, $P < .01$.

lated to program type ($\chi^2=26.75$, $df=12$, $P < .01$). The groups most likely to see resistance to the limitation of smoking were program heads in AD nursing, elementary education, and health education (programs most likely to be on multipurpose campuses); groups in dentistry and public health were least likely to see resistance (programs likely to be on medical center campuses).

The current smoking status of the program heads was also a significant factor in viewing resistance to smoking limitation. Nonsmoking program administrators were most likely to see resistance to the limitation of smoking, and current cigarette smokers were least likely to see such resistance. Administrators who replied that there was resistance to limitation of smoking at their institutions identified general faculty ($N=80$, 58.0 percent) and students ($N=79$, 57.3 percent) as those most resistant.

The following tabulation shows the relationship between the perceived resistance to smoking limitation and the smoking status of program administrators.

Smoking status ¹	Smoking limitation	No smoking limitation	Don't know	Total
Nonsmoker	69	54	38	161
Former cigarette smoker	34	24	20	78
Current cigarette smoker	19	43	21	83
Pipe or cigar smoker	9	7	6	22
Total	131	128	85	344

¹ $\chi^2 = 13.22$, $df = 6$, $P < .05$.

If the institutions that are educating health professionals are truly preparing students to be future exemplars and knowledgeable about the association between cigarette smoking and disease, then it is reasonable to expect such teaching institutions to "practice what they preach" by restricting smoking. The prohibition of smoking in health education facilities could be a first step.

Student and faculty smoking. Respondents were asked to estimate the percentage of students enrolled in their programs who were current cigarette smokers. Program administrators from health education programs and schools of public health were the respondents most likely to place their students in the lowest smoking category. Program heads from nursing (both AD and BSN) and elementary education programs placed their students in the higher ranges. Following is a tabulation of the percentage of 331 students who smoked according to the estimates of their program head, by program type.

Program type ¹	Student smokers		
	0-25 percent	25-50 percent	51-100 percent
Medicine	21	7	0
Dentistry	14	8	1
Nursing (AD) ..	29	38	12
Nursing (BSN) .	31	23	4
Public health ...	9	2	0
Health education	44	11	3
Elementary education	34	32	8
Total	182	121	28

¹ $\chi^2 = 33.28$, $df = 12$, $P < .001$.

The respondents estimated that higher percentages of their faculties smoked than of the students. The percentage range of smokers among 353 faculty members was estimated by their program heads to be as follows:

Estimated percentage range	Faculty smokers	
	Number	Percent
0-25	238	67.4
26-50	99	28.1
51-75	16	4.5
76-100	0	0

Programs heads estimating the highest percentage of faculty smokers were in elementary education, medicine, and dentistry; health education program heads reported the lowest percentage ($\chi^2=21.38$, $df=12$, $P < .05$).

The smoking status of the program heads was not significantly related to their perception of the estimated number of faculty or students who were smokers.

Antismoking programs. Smoking education and smoking cessation programs have become increasingly popular. To determine the involvement of health professional departments in such programs, the sponsorship and intended audience of such programs were determined. Only 136 (37.2 percent) of the respondents indicated that some form of such a program had been offered at their institution; 220 (60.1 percent) said no program had been offered, and 10 (2.7 percent) did not know. Health education was identified as the most active department in offering such programs. Sponsors of the antismoking programs are shown in table 6 in descending order of frequency. Larger schools were more likely to sponsor smoking programs ($\chi^2=15.12$, $df=5$, $P < .01$) than smaller schools. Larger hospitals were also more likely to sponsor smoking cessations programs than smaller ones. (26). This difference was most apparent for schools with a student body of more than 15,000. Perhaps larger institutions, in general, have more resources available to sponsor such offerings. There was no significant relationship with any other demo-

graphic variable, including the smoking status of the program head.

Most antismoking programs were aimed at more than one audience, but the majority of the programs were for students. Most institutions were serving their own constituents rather than a wider audience, as evidenced by the following table (multiple responses were given).

Table 6. Distribution of 136 sponsors of smoking education and cessation programs¹

<i>Sponsoring unit</i>	<i>Number</i>	<i>Percent</i>
Health education	70	51.5
Medicine	13	9.6
Student organizations	12	8.8
Nursing	12	8.8
Elementary education	8	5.8
Continuing education	4	2.9
Psychology department	3	2.2
Physical education	3	2.2
Counseling center	3	2.2
Dentistry	2	1.5
Others ²	6	4.4

¹ Because there are fewer schools of public health, dentistry, and medicine in the United States than for the other disciplines discussed, the distribution in this table may be affected.

² Receiving 1 response each—cancer society, pharmacy, cancer research center, school nurse, public health graduate school, and unspecified.

<i>Audience</i>	<i>Number</i>	<i>Percent</i>
Students	113	83.1
Faculty	90	66.2
General public	68	50.0
Community teenagers	12	8.8
Other	5	3.7

Health professionals' involvement in antismoking programs. Questions were asked to elicit opinions about faculty and student involvement in antismoking programs. The first question was whether health professional faculty members had a responsibility to actively discourage smoking in public places. There were no statistically significant relationships between responses to this question and any parameter except the current smoking status of the respondent. Current cigarette smokers comprised more than 50 percent of those who disagreed with the statement that faculty members had such a responsibility (table 7).

The responses to opinion questions about the involvement of health professional students in antismoking efforts are also shown in table 7. Again, current cigarette smokers were much more likely to disagree that health professional students should be actively involved in either the restriction of smoking in public places or in public education about smoking. While there was no statistically significant relationship between these questions and program type, program administrators

Table 7. Responses to opinion items about health professionals involvement in antismoking activities, by smoking status of program administrators

<i>Question and response</i>	<i>Non-smoker</i>	<i>Former cigarette smoker</i>	<i>Current cigarette smoker</i>	<i>Pipe or cigar smoker</i>	<i>Total</i>
Health professional faculty should discourage smoking in public places ¹					
Agree	143	65	52	13	273
Disagree	12	8	28	7	55
Total	155	73	80	20	328
Health professional students should be actively involved with activities restricting smoking in public places ²					
Agree	134	66	48	12	260
Disagree	17	7	26	7	57
Total	151	73	74	19	317
Health professional students should be actively involved in public education about smoking ³					
Agree	135	67	50	13	265
Disagree	16	6	24	6	52
Total	151	73	74	19	317

¹ $\chi^2 = 34.63$, $df = 3$, $P < .001$.

² $\chi^2 = 27.46$, $df = 3$, $P = < .001$.

³ $\chi^2 = 24.34$, $df = 3$, $P < .001$.

NOTE: Variations in totals are due to nonresponse.

in elementary education, followed closely by those in both types of nursing programs, were the groups most likely to disagree about desirability of active involvement by health professional students. Health education and medical program administrators were most likely to agree that these students should be actively involved in such activities. As shown in table 6, these two groups were the most active sponsors of smoking programs.

Smoking and curriculum. Inclusion of the health consequences of smoking in the curriculum of health professionals varies considerably according to program type. There is also much variation in the context of the presentation of smoking hazards. The major means of presentation that health program administrators described included a pathological or disease-associated orientation, a preventive or prospective context, a combination of preventive and pathological aspects, or integration into various unspecified courses in the curriculum. Among those respondents describing the curriculum, 8.2 percent indicated that the hazards of smoking were not included in any way (table 8). The preventive orientation was stressed in the public health and health education programs; in medicine, dentistry, and both types of nursing programs, the pathological orientation was stressed—these were the groups in this study with the highest percentage of current cigarette smokers among their program heads. BSN nursing programs showed the greatest amount of curriculum integration. Further investigation into teaching methods, time allotted, types of learning activities, and specific content is recommended.

In medical curriculums, most information about smoking was concentrated in oncology, cardiology, pulmonary disease, general medicine, and pathology

courses. In dental curriculums, the information was concentrated in general and oral pathology, oral medicine, and periodontics. In nonintegrated nursing programs, the information was generally placed in medical-surgical nursing; in some programs, it was placed in mental health, community health, and maternal-child health nursing.

Although an analysis of elementary education curriculums is not included in table 8, many of these program heads indicated that a health course that included information on smoking was required. A review of the specific requirements for 1978-79 elementary teacher certification revealed that 19 States required a health course (29). The actual number may be higher, as some States only list "completion of an approved program of teacher education" without listing specific requirements (29).

Of the health professions discussed here, the most attention in the literature has probably been focused on smoking among medical students and the influence of medical education on smoking habits. There is some indication from these studies that medical students who smoke know the theory of the relationship between smoking and disease, but they are not convinced that it is true (30,31). A more prevention-oriented approach that illustrates the importance of discouraging smoking in patients who are healthy should be emphasized in medical curriculums (30). In this study, 60.9 percent of the medical program heads indicated that the health consequences of smoking were being taught in a disease-oriented context.

Summary and Comments

Despite recognition of the health dangers of smoking, the most knowledgeable and influential professions are

Table 8. Placement of smoking in various health curriculums, according to 244 health program administrators

Orientation	Curriculums											
	ADN		BSN		Medical		Dental		Health education		Public health	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Pathological	32	45.7	22	34.3	14	60.9	12	6.0	2	3.5	1	10.0
Integrated	16	22.9	24	37.5	0	0.0	1	5.0	12	21.1	2	20.0
Combination of prevention and pathological	7	10.0	6	9.4	4	17.4	2	10.0	24	42.1	2	20.0
Preventive	11	15.7	4	6.3	1	4.3	1	5.0	19	33.3	5	50.0
None	4	5.7	8	12.5	4	17.4	4	20.0	0	0.0	0	0.0
Total	70	100.0	64	100.0	23	100.0	20	100.0	57	100.0	10	100.0

NOTES: Nonresponses are omitted. ADN—associate degree in nursing; BSN—baccalaureate degree in nursing.

still not actively engaging in efforts against smoking. Among respondents in this study, dental, nursing, and medical program heads accounted for the highest percentage of current cigarette smokers, while program heads in public health, health education, and elementary education accounted for the lowest percentage. The highest percentage of former cigarette smokers was found among respondents from public health and health education programs.

Schools with larger student bodies were more likely to have written smoking policies and departments that sponsored some type of antismoking program. Departments of health education were far more likely to sponsor such programs than any other group. The majority of the antismoking programs were aimed at students and faculty; only half were geared to the general public.

The smoking status of the respondents—all program administrators—was the chief influence on their perceptions of the role of health professional faculty and students in the restriction of smoking, in public education about smoking, and in other areas. Health professional program heads do not seem to be providing their students or the public with an exemplar image.

To continue to permit unrestricted smoking in institutions for educating health professionals is to give tacit approval to cigarette smoking, regardless of what is taught in the curriculum. Health program heads need to exert leadership not only in teaching about the hazards of smoking, but also in practicing what is preached.

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